



## MIT SCALE RESEARCH REPORT

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**Research Report: ZLC-2016-6**  
**Facilitating Horizontal Collaboration in Supply Chains**  
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# Facilitating Horizontal Collaboration in Supply Chains

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## Summary:

The thesis aims to develop horizontal collaboration to become more widely adopted across industries in future. Our research addresses the automotive and 3PL industries, but maintains a generic approach for applications across different industries. This research identifies the key drivers and barriers behind horizontal collaboration, contrasts and details current prominent horizontal collaboration practices in US and in Europe, identifies key areas of focus for companies looking at horizontal collaboration to improve their supply chain and develops a new system of facilitating horizontal collaboration in future in a manner that is more natural and sustainable.



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## KEY INSIGHTS

1. Key drivers to horizontal collaboration include cost savings, increased service levels and increased sustainability. Key barriers to horizontal collaboration include human resistance, operational difficulties, a lack of facilitation tools and the absorption of extra risks.
2. The factors that are most important in improving horizontal collaborations are a focus on value sharing, sustainability and innovation. Other top factors include a focus on big data usage and a willingness to look for new collaborations.
3. By taking part in our system of facilitating horizontal collaborations, a supply chain can expect to save up to 47% on shipping costs and increase delivery frequency by up to 78%.

## Introduction

Horizontal collaboration (HC) is any known and voluntary cooperation between two (or more) companies at one level in the market that is designed to realize mutual benefits which could not be achieved independently. We are addressing horizontal collaboration as it is occurring for logistical purposes today.

Horizontal collaboration can lead to significant cost savings, increased service levels and reduced carbon footprint simultaneously. Some horizontal collaboration relationships have yielded supply chain savings of up to 39%, reduced CO2 output and improved service levels (Verstrepen, 2010). We call these benefits the drivers to horizontal collaboration as they are factors in encouraging its use. Horizontal collaboration, however, does not celebrate widespread acceptance today. Human elements, operational difficulties, a lack of facilitation tools and the absorption of extra risks are key barriers that prevent companies from approaching horizontal collaboration.

## Methodology

The methodology of this project is multifaceted. In progressing through it, quantitative and qualitative analyses are extensively used. Our research includes an in-depth literature review, conducting an advanced statistical analysis of horizontal collaboration data (as collected by a colleague working on this project in 2015) and interviewing industry professionals to verify and build on our work as we advanced through it. We also conducted a simulation of horizontal collaboration using our recommendations to help verify our research.

## Research

Companies in different sectors around the world have paired up with one other to achieve many new efficiencies in the supply chain. Current horizontal collaborations practices come in many forms and structures. Our research details horizontal collaboration in logistics as it is currently occurring around the world.

We started our research by targeting the automotive and 3PL industries to identify horizontal collaboration in the supply chains of these industries. We find that horizontal collaboration is relatively widespread in the 3PL industry as cost savings and service level improvements can quickly be achieved. Horizontal collaboration in the automotive industry is not as widespread because of stiff competition, strong mistrust and other operational challenges.

Horizontal collaboration has often been considered as being more accepted in Europe than in the US. Our research finds that this is not necessarily the case. We find little differences between the amounts of collaborations occurring in both locations and also between the lengths of time for which they have been occurring.

Our research has also identified 13 factors that play a large role in predicting success levels for different outcomes in horizontal collaboration relationships.

Figure 1: List of factors that play a role in predicting horizontal collaboration success levels. Source: Own

3PL contact	Compatibility
Relationship Level	Contracts
Sharing (Value Sharing)	Trust
Sustainability & Innovation	Symmetry
Knowledge Sharing	Dependence
Tech/Big Data Usage	Synergy
New Collaboration Exploration	

### Developing Horizontal Collaboration Frameworks

Using examples of current horizontal collaboration, we developed frameworks of successful horizontal collaborations today. We have titled them Supplier HC (horizontal collaboration), Customer HC, 3PL HC and Inverse Needs HC. Supplier HC happens when suppliers get together to make joint decisions to coordinate logistics to the customer. Customer HC happens when customers get together and make joint logistics decisions to coordinate logistics from the producer. 3PL HC happens when multiple 3PLs pair up to expand their networks and achieve greater efficiencies across their business model. Inverse needs HC happens when two companies with inverse logistical needs pair up to achieve savings (such as coordinating reverse load flows).

### Recommendations

To get the largest positive impact with a horizontal collaboration relationship, we recommend that companies (wishing to improve horizontal collaboration in general) focus on developing good value sharing techniques while working on their Sustainability and Innovation. In fact, all the factors that we have found play a role in predicting at least one of the horizontal collaboration outcomes.

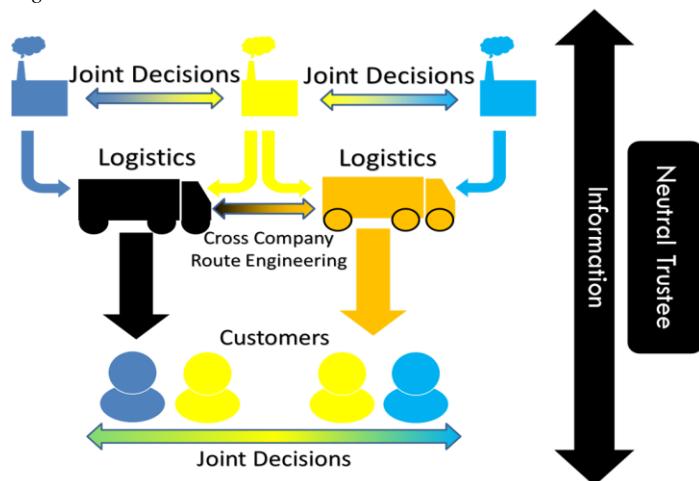
Horizontal collaboration happens in many different forms; however, there is a general structure for the formation of horizontal collaboration. This process typically includes identifying gains from a potential HC relationship, recognizing possible partners, pairing with a partner, establishing a trustee, developing trust and hopefully achieving desired goals. Using these, we have established a new framework for horizontal collaboration that takes into account all of the aforementioned frameworks as well as the process for forming horizontal collaborations.

To develop a better framework, we recommend making changes to the process of forming a horizontal collaboration to allow for its easier implementation. These changes include smart-recognition of partners, micro pairing, and cross route engineering. Smart recognition of partners is a statistical process we developed to quickly identify the best potential partners when many are available. Micro pairing is a risk reduction process that we developed by pairing many partners together in different logistical operations. Cross company route engineering is a process of sharing route structures better between logistics providers in an

effort to achieve better efficiencies in a collaborative relationship.

We also recommend adding a neutral trustee to manage this process. This neutral trustee should be an overarching entity designed to facilitate information exchange and coordination efforts between companies. It should help to demonstrate/sell the drivers of horizontal collaboration to companies and decrease the barriers through risk management.

Figure 2: New Collaboration Model. Source: Own



### Conclusion

To verify our work, we created a simulation using 6 companies with 9 possible routes and varying shipment frequencies. Using our system resulted in supply chain savings of up to 48% on shipping costs and an increase in delivery frequency by up to 22%. A more advanced model with more route structures that we created showed an increase in delivery frequency of up to 78%. In developing and using these processes simultaneously, horizontal collaboration relationships can merge every framework together to form an all-encompassing process that can easily be expanded. The end design should form a web of horizontal and vertical collaborations that achieves the most efficient system possible. Potential collaborations can be developed organically while overarching processes are optimized and risk is reduced. Potential partners can quickly be identified and connected on a mathematical and statistical basis. Pairs can quickly be made and redesigned on a small level to develop much greater network efficiencies. This process will allow for versatility and stability as companies adjust to an ever changing world.

### References

Verstrepen, S. (2010, June 1). Establishing a Common Vocabulary: What IS Horizontal Collaboration? Brussels, Belgium.